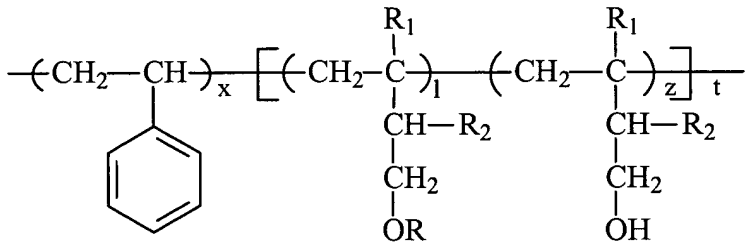
Claims

What is claimed is:

1. A compound of formula (I):



(I)

wherein

R^1 is hydrogen and R^2 is methyl or R^1 is methyl and R^2 is hydrogen;

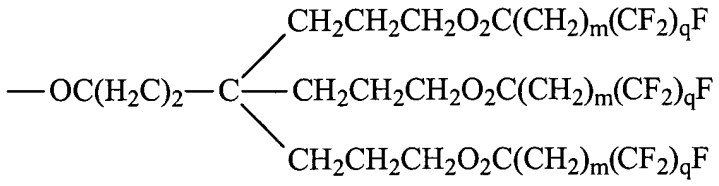
x is about 100 to about 5,000;

z is about 20 to about 1,000;

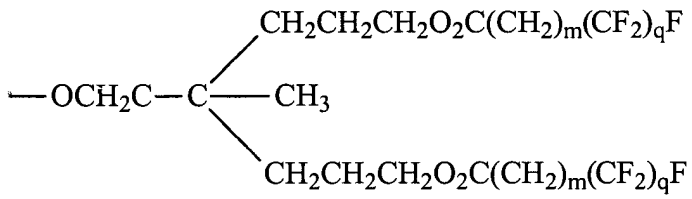
l is about 20 to about 1,000;

t is about 40 to about 2,000; and

R is a compound of formula (II) or (III):



(II)



(III)

wherein

m is 0 to about 15; and

q is about 5 to about 15.

2. The compound of claim 1 wherein x is about 500 to about 1,000.

3. The compound of claim 1 wherein z is about 200 to about 500.

4. The compound of claim 1 wherein l is about 200 to about 500.

5. The compound of claim 1 wherein t is about 200 to about 1,000.

6. The compound of claim 1 wherein m is about 4 to about 10.

7. The compound of claim 1 wherein q is about 6 to about 12.

8. The compound of claim 1 wherein x is about 500 to about 1,000; z is about 200 to about 500; l about 200 to

about 500; t is about 200 to about 1,000; m is about 4 to about 10; and q is about 6 to about 12.

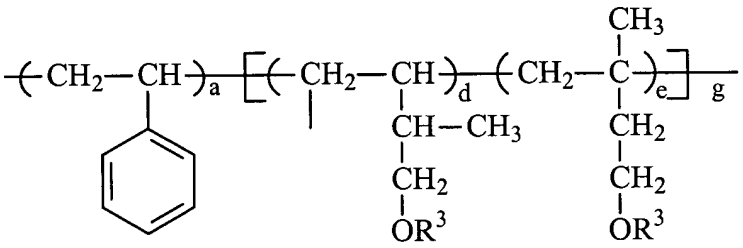
9. The compound of claim 1 having an average molecular weight of about 10,000 to about 500,000.

10. The compound of claim 1 having an average molecular weight of about 75,000 to about 150,000.

11. The compound of claim 1 that is blended with a thermoplastic elastomer block copolymer.

12. The compound of claim 11 wherein the thermoplastic elastomer block copolymer is styrene-ethylene/butylene-styrene (SEBS).

13. A compound of formula (IV):



(IV)

wherein

a is about 200 to about 5,000;

d is about 100 to about 500;

e is about 100 to about 500;

g is about 200 to about 1,000;

R^3 is a compound of formula (V):

(V)

wherein

j is about 1 to about 15.

14. The compound of claim 13 wherein a is about 150 to about 3,000.

15. The compound of claim 13 wherein d is about 100 to about 300.

16. The compound of claim 13 wherein e is about 100 to about 300.

17. The compound of claim 13 wherein g is about 200 to about 600.

18. The compound of claim 13 wherein j is about 6 to about 8.

19. The compound of claim 13 wherein a is about 150 to about 3,000; d is about 100 to about 300; e is about 100 to about 300; g is about 200 to about 600; and j is about 6 to about 8.

20. The compound of claim 13 having an average molecular weight of about 10,000 to about 500,000.

21. The compound of claim 13 having an average molecular weight of about 50,000 to about 150,000.

22. The compound of claim 13 having an average molecular weight of about 10,000 to about 500,000.

23. The compound of claim 13 having an average molecular weight of about 50,000 to about 150,000.

24. The compound of claim 13 that is blended with a thermoplastic elastomer block copolymer.

25. The compound of claim 24 wherein the thermoplastic elastomer block copolymer is styrene-ethylene/butylene-styrene (SEBS).

26. A surface active block copolymer (SABC) comprising a thermoplastic elastomer block copolymer and a diblock copolymer, wherein the diblock copolymer comprises semifluorinated monodendron side chains.

27. The surface active block copolymer (SABC) of claim 26 wherein thermoplastic elastomer block copolymer is styrene-ethylene/butylene-styrene (SEBS).

28. The surface active block copolymer (SABC) of claim 26 having a surface energy of about 8 mN/m to about 20 mN/m.

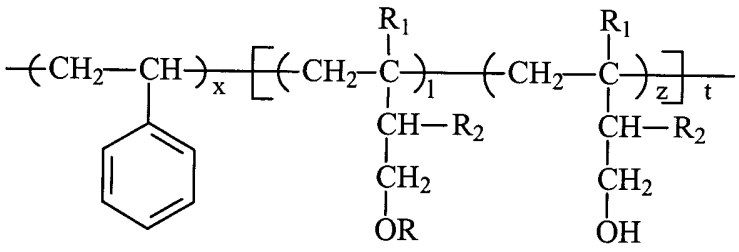
29. The surface active block copolymer (SABC) of claim 26 having a water contact angle of about 100 degrees to about 150 degrees.

30. The surface active block copolymer (SABC) of claim 26 wherein the thermoplastic elastomer block copolymer is

present in about 1 wt.% to about 20 wt.% of the surface active block copolymer (SABC).

31. The surface active block copolymer (SABC) of claim 26 wherein the diblock copolymer is present in about 2 wt.% to about 5 wt.% of the surface active block copolymer (SABC).

32. The surface active block copolymer (SABC) of claim 26 wherein the diblock copolymer is a compound of formula (I):



(I)

wherein

R^1 is hydrogen and R^2 is methyl or R^1 is methyl and R^2 is hydrogen;

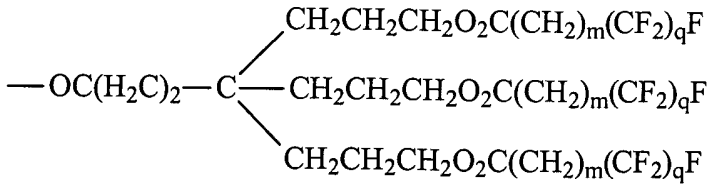
x is about 100 to about 5,000;

z is about 20 to about 1,000;

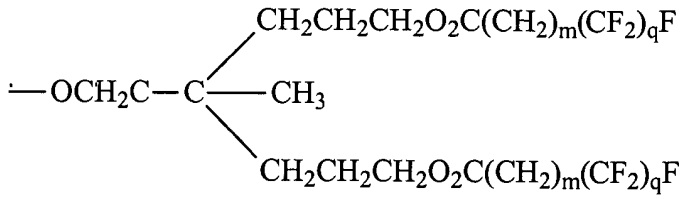
l is about 20 to about 1,000;

t is about 40 to about 2,000; and

R is a compound of formula (II) or (III):



(II)



(III)

wherein

m is 0 to about 15; and

q is about 5 to about 15.

33. The surface active block copolymer (SABC) of claim 26 that is useful in the manufacture of an anti-fouling coating, a low energy surface material, or a combination thereof.

34. The surface active block copolymer (SABC) of claim 26 that is non-toxic, does not undergo surface reconstruction when immersed in a polar environment, possesses anti-stick properties, possesses non-wetting properties, possesses low friction properties, resists biofouling by marine organisms, exhibits minimal protein adsorption, resists heterogeneous nucleation of ice, is biocompatible, or any combination thereof.

35. A surface active block copolymer (SABC) comprising a thermoplastic elastomer block copolymer and a diblock copolymer, wherein the diblock copolymer comprises oligoethylene glycol side chains.

36. The surface active block copolymer (SABC) of claim 35 wherein the thermoplastic elastomer block copolymer is styrene-ethylene/butylene-styrene (SEBS).

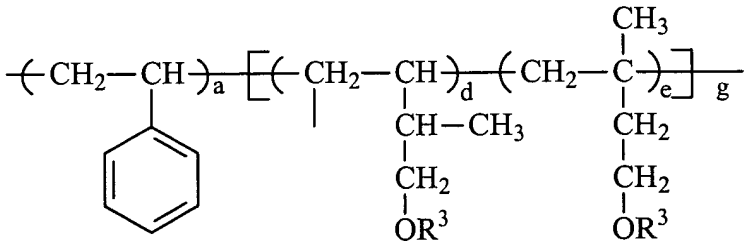
37. The surface active block copolymer (SABC) of claim 35 that has a surface energy of about 40 mN/m to about 60 mN/m.

38. The surface active block copolymer (SABC) of claim 35 that has a water contact angle of about 25 degrees to about 60 degrees.

39. The surface active block copolymer (SABC) of claim 35 wherein the thermoplastic elastomer block copolymer is present in about 80 wt.% to about 99 wt.% of the surface active block copolymer (SABC).

40. The surface active block copolymer (SABC) of claim 35 wherein the diblock copolymer is present in about 2 wt.% to about 5 wt.% of the surface active block copolymer (SABC).

41. The surface active block copolymer (SABC) of claim 35 wherein the diblock copolymer is a compound of formula (IV):



(IV)

wherein

a is about 200 to about 5,000;

d is about 100 to about 500;

e is about 100 to about 500;

g is about 200 to about 1,000;

R^3 is a compound of formula (V):

(V)

wherein

j is about 1 to about 15.

42. The surface active block copolymer (SABC) of claim 35 useful in the manufacture of an anti-fouling coating, a low energy surface material, or a combination thereof.

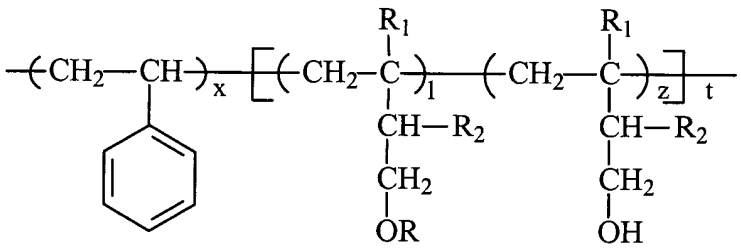
43. The surface active block copolymer (SABC) of claim 35 that is non-toxic, does not undergo surface reconstruction when immersed in a polar environment, possesses anti-stick properties, possesses non-wetting properties, possesses low friction properties, resists biofouling by marine organisms, exhibits minimal protein adsorption, resists heterogeneous nucleation of ice, is biocompatible, or any combination thereof.

44. A method for forming a surface active block copolymer (SABC) comprising blending an effective amount of a thermoplastic elastomer block copolymer and an effective amount of a diblock copolymer, wherein the diblock

copolymer comprises semifluorinated monodendron side chains.

45. The method of claim 44 wherein the thermoplastic elastomer block copolymer is styrene-ethylene/butylene-styrene (SEBS).

46. The method of claim 44 wherein the diblock copolymer is a compound of formula (I):



(I)

wherein

R^1 is hydrogen and R^2 is methyl or R^1 is methyl and R^2 is hydrogen;

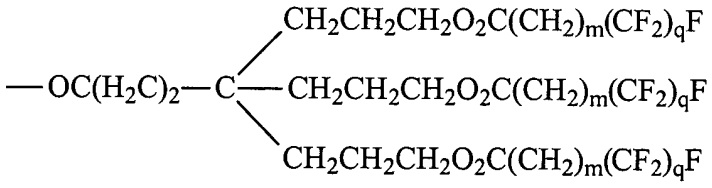
x is about 100 to about 5,000;

z is about 20 to about 1,000;

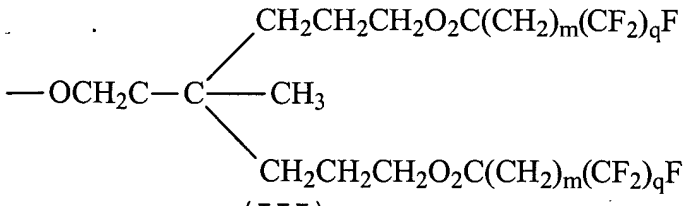
l is about 20 to about 1,000;

t is about 40 to about 2,000; and

R is a compound of formula (II) or (III):



(II)



(III)

wherein

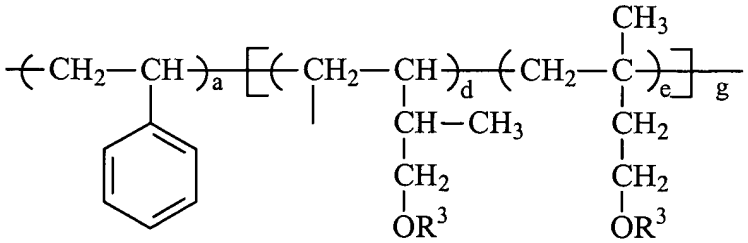
m is 0 to about 15; and

q is about 5 to about 15.

47. A method for forming a surface active block copolymer (SABC) comprising blending an effective amount of a thermoplastic elastomer block copolymer and an effective amount of a diblock copolymer, wherein the diblock copolymer comprises oligoethylene glycol side chains.

48. The method of claim 47 wherein the thermoplastic elastomer block copolymer is styrene-ethylene/butylene-styrene (SEBS).

49. The method of claim 48 wherein the diblock copolymer is a compound of formula (IV):



(IV)

wherein

a is about 200 to about 5,000;

d is about 100 to about 500;

e is about 100 to about 500;

g is about 200 to about 1,000;

R^3 is a compound of formula (V):

(V)

wherein

j is about 1 to about 15.

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